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Engineer Research and  
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# Fluorescence Remote Sensing Laboratory

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## **Description and Background**

The Fluorescence Remote Sensing Laboratory at ERDC-TEC is engaged in basic and applied research in fluorescence sensing focused on the development and testing of fluorophores for recovery by remote sensing. The lab guides the development and testing of organic (living) and inorganic materials that may be used for the targeting and detection of harmful agents or environmental threats of relevance to the military or civil communities.

## **Key Capabilities**

The lab has the capabilities to measure both steady-state and lifetime (decay) fluorescence spectra for fluorophores using state-of-the-art spectrometers including a frequency domain lifetime spectrofluorometer that can measure fluorescence decays in picosecond lifetimes. In addition, the lab supports imagery-based fluorescence measurements using laser-induced fluorescence as well as passive fluorescence measurements by Fraunhofer Line Discrimination. These measurements support defense, intelligence, and mapping agencies with baseline research in polymer detection, backgrounds, and characterization of fluorophores for environmental analysis.

## **Support Technology**

The lab's support technologies include development and spectral characterization of fluorescent molecular imprinted polymers and fluorescent proteins. Additionally, the lab has demonstrated novel ways to improve signal to noise levels in fluorophores (improved quantum efficiency) for recovery by synoptic sensors.

## **Benefits**

Customers have benefited from the lab's work in many ways. The lab's strength has been the characterization and measurement of fluorophore efficiency. These measurements are cost-effective in that time is not wasted on fluorescence signals that are weak or environmentally sensitive. Furthermore, precision fluorescence measurements can assist in the development and synthesis of specific fluorophores by customers needing to test sensing characteristics of fluorescent reporters.

## **Success Stories**

Recent work has involved synthesis of a fluorescent molecular imprinted polymer for biological agent detection and the characterization of green fluorescent protein variants for environmental sensing associated with explosives detection.

## **Point of Contact**

U.S. Army Engineer Research and Development Center, Topographic Engineering Center (TEC), ATTN: CEERD-TR-S, 7701 Telegraph Road, Alexandria, VA 22315-3864; Internet e-mail address: [Rebecca.Ragon@erdc.usace.army.mil](mailto:Rebecca.Ragon@erdc.usace.army.mil)